

Buechel at column 11, lines 1-4.

Alternate coating materials are zirconium, titanium boride, titanium carbide, aluminum oxide and diamond.

Buechel at column 5, lines 13-15.

Buechel does not disclose polycrystalline diamond compact as a material for the load bearing and articulation surface of a femoral head. Applicant's claims recite this limitation and Applicant's specification provides substantial detail concerning the materials necessary for making polycrystalline diamond compact, the manufacturing techniques useful for fabricating polycrystalline diamond compact, and the manufacturing structures and techniques for creating a convex spherical polycrystalline diamond compact that can serve as the load bearing and articulation surface of a femoral head. Because Buechel does not provide such information and merely suggests an *idea* that diamond might be used in a joint, Buechel is not an enabling prior art reference and rejections based on Buechel should be withdrawn.

2. Buechel (U.S. Patent No. 5,702,448) does NOT disclose a femoral head that has a polycrystalline diamond compact as the load bearing and articulation surface. The Examiner referred to Buechel at column 10, lines 27-42, which states:

A prosthetic device for biological fixation to a bone, said prosthetic device comprising a metallic alloy substrate, a first portion of said substrate defining a bone ingrowth surface area having a non-smooth surface configuration for increasing surface area and promoting bone ingrowth, a smooth articulating surface area spaced from the bone ingrowth surface area and a smooth load bearing surface area spaced from the bone ingrowth surface area and the articulating surface area, the bone ingrowth surface area and the articulating surface area and the load bearing all being provided with a unitary substantially biologically inert scratch resistant coating exhibiting greater hardness than the metallic alloy substrate for substantially preventing metallic ion release from the substrate for preventing production of wear debris, said biologically inert scratch resistant coating defining a thickness of 8-10 microns, whereby the coating prevents ion leaching from the substrate into adjacent tissues.

Buechel (U.S. Patent No. 5,702,448) at column 10, lines 27-42. In this passage, Buechel recites coating a substrate with a hard coating to prevent metal from the substrate from being released in the body. That is generally the goal of all prosthetic joint development effort worldwide, as replacements to UHMWPE are sought. However, Buechel does not disclose the combination of elements found in Applicant's claims, especially a femoral head that has a polycrystalline compact load bearing and articulation surface.

The Examiner also points out Buechel at column 11, lines 1-4, which states:

A prosthetic device as in claim 12, wherein the biologically inert material is selected from the group consisting of titanium nitride, zirconium, titanium boride, titanium carbide, aluminum oxide and diamond.

Buechel at column 11, lines 1-4. Additionally, at column 5, lines 13-15, Buechel states:

Alternate coating materials are zirconium, titanium boride, titanium carbide, aluminum oxide and diamond.

Buechel at column 5, lines 13-15.

These are the only mention of diamond in Buechel. There are many types of diamond including natural diamond, monocrystalline diamond, polycrystalline diamond compacts, diamond deposited by chemical vapor deposition, diamond deposited by physical vapor deposition, and diamond deposited by laser plasma deposition. Applicant has claimed a femoral head that has polycrystalline diamond compact on its load bearing and articulation surface. Buechel does not disclose polycrystalline diamond compact as the load bearing and articulation surface of a femoral head. Further, as explained above, Buechel does not enable the use diamond as a bearing surface material in prosthetic joint. Therefore Buechel does not anticipate Applicant's claims.

The Examiner points out that Buechel teaches polishing. It is true that polishing of prosthetic joints was performed in the prior art. However, the prior art does not teach polishing a femoral head with a polycrystalline diamond compact load bearing and articulation as recited in Applicant's claims.

The Examiner points out Buechel column 6, lines 37-56 for metals that may be used as a substrate. In particular Buechel points out titanium aluminum vanadium, and cobalt-chromium molybdenum as substrate materials. Buechel chooses these materials for biocompatibility. However, Buechel does not teach the all-important step of using such materials in the construction of a polycrystalline diamond compact load bearing and articulation surface of a femoral head. Consequently, Buechel does not anticipate the combination of elements claimed by Applicant.

Therefore Buechel does not anticipate any of Applicant's claims.

§ 103 Rejections

The Examiner has rejected some pending claims under § 103. As explained above, Buechel is not an enabling reference with respect to femoral heads that have polycrystalline diamond compact load bearing and articulation surfaces, so Buechel should be withdrawn.

3. Davidson (U.S. Patent No. 5,370,694) does NOT disclose use of a polycrystalline diamond compact as the load bearing and articulation surface of a femoral head, which is claimed by Applicant. Column 5, lines 52-61 of Davidson states:

wherein a femoral head cooperates with and slides against natural cartilage, may have its bearing surface (the femoral head's surface in this case) coated with a layer of blue-black or black zirconium oxide or zirconium nitride to produce a smooth, low friction surface that does not release metal ions into synovial fluid in the joint or surrounding tissue.

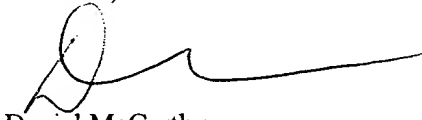
Davidson (U.S. Patent No. 5,370,694) at column 5, lines 52-61.

The disclosure of Davidson is "**blue-black or black zirconium oxide or zirconium nitride**". Davidson makes NO disclosure of use of a polycrystalline diamond compact as the load bearing and articulation surface in a femoral head. Mere disclosure of CVD or PVD does not suggest Applicant's femoral head that has a polycrystalline diamond compact load bearing and articulation surface. Since a polycrystalline diamond compact load bearing and articulation

surface is made by high pressure and high temperature sintering, CVD and PVD techniques will not produce what Applicant has claimed. (Applicant note that CVD and PVD can be used to lay a film of diamond on a substrate, but the film is generally thin and fragile and is inferior to polycrystalline diamond compact for durability and longevity.) Since all of Applicant's pending claims are limited to use of polycrystalline diamond compact s the load bearing and articulation surface in a femoral head, Davidson does not disclose the elements of Applicant's claims, anticipate the elements of Applicant's claims, or render them obvious.

For the reasons mentioned above, Applicant believes that his pending claims are both novel and non-obvious in light of the prior art. Reconsideration of the claims is requested.

Respectfully submitted this 2nd day of November, 2001.

A handwritten signature in black ink, appearing to read 'Daniel McCarthy', with a long horizontal flourish extending to the right.

Daniel McCarthy
Reg. No. 36,600
Parsons, Behle & Latimer
201 South Main Street, Suite 1800
P.O. Box 45898
Salt Lake City, Utah 84145
Tel: (801) 536-6830 or (801) 532-1234
Fax: (801) 536-6111
Email: DMcCarthy@pblutah.com